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ART 34 ANDT

CLAIMS

1. A machining data generator for generating machining data for shaping an external shape of a piston, said machining data generator comprising:

a noncircular part shape data fetching unit that reads a machining data sheet in which both noncircular part shape data for machining a noncircular part having a noncircular cross section of the piston and machining condition data are described and that fetches the noncircular part shape data from the machining data sheet; and

a NC machining data calculating unit that recognizes the machining condition data described in the machining data sheet and that calculates NC machining data on the basis of the recognized machining condition data and the noncircular part shape data fetched by the noncircular part shape data fetching unit.

2. The machining data generator according to claim 1, wherein additional shape data on a part other than the noncircular part is described in the machining data sheet, and

the NC machining data calculating unit recognizes the additional shape data described in the machining data sheet together with the machining condition data and calculates NC machining data on the basis of the recognized machining condition data and the additional shape data, and the noncircular part shape data fetched by the noncircular part shape data fetching unit.

3. The machining data generator according to claim 1 or 2, wherein the machining data sheet is a sheet provided by a spreadsheet software and the noncircular part shape data is described in the sheet of the spreadsheet software in a form of matrix data indicating coordinates for machining and arranged in rows and columns.

4. The machining data generator according to claim 3, wherein the noncircular part shape data is defined by axial coordinates on the axis of a workpiece (points on a Z-axis), angular coordinates (angles about a C-axis) and radial

coordinates (points on a Y-axis), and the noncircular part shape data is described in the sheet of the spreadsheet software in a form of matrix data indicating axial coordinates and angular coordinates arranged in rows and columns.

5. The machining data generator according to claim 3 or 4, wherein shape-data-describing-area-specifying data that specifies a cell region in which the matrix data is entered is described in the machining data sheet, and

the noncircular part shape data fetching unit recognizes the cell region specified by the shape-data-describing-area-specifying data when the noncircular part shape data fetching unit reads the machining data sheet to fetch the noncircular part shape data from the cell region.

6. The machining data generator according to any one of claims 1 to 5, further comprising a graphic display unit that graphically displays the noncircular part shape data.

7. The machining data generator according to claim 6, wherein the graphic display unit includes an enlarging unit that displays a part of the graphically displayed noncircular part shape data in an enlarged picture.

8. The machining data generator according to claim 6 or 7, wherein the graphic display unit has a correcting unit that corrects the graphically displayed noncircular part shape data on a graphic display screen.

9. The machining data generator according to any one of claims 6 to 8, wherein the graphic display unit has a tolerance data display unit graphically displays tolerance data on tolerances for the noncircular part shape data together with the noncircular part shape data.

10. The machining data generator according to any one of claims 1 to 9, further comprising a simulation display unit that graphically displays a machining position and a machining speed on a time axis as a reference axis on the basis of the NC machining data calculated by the NC machining data calculating unit.

11. The machining data generator according to claim 10,

wherein the simulation display unit indicates a time indication line that moves along the time axis on the graphic display screen displaying a machining position and a machining speed, and displays information about a rotation of the spindle at a position indicated by the time indication line.

12. A machining data generating method of generating machining data for shaping an external shape of a piston, said method comprising:

preparing a machining data sheet describing noncircular part shape data specifying machining operations for machining a noncircular part having a noncircular cross section of the piston together with machining condition data;

reading the machining data sheet and fetching the noncircular part shape data from the machining data sheet; and

recognizing the machining condition data described in the machining data sheet and calculating NC machining data on the basis of the recognized machining condition data and the fetched noncircular part shape data.

13. The machining data generating method according to claim 12, wherein additional shape data on a part other than the noncircular part is described additionally in the machining data sheet,

the additional shape data described in the machining data sheet is recognized together with the machining condition data, and

the NC machining data is calculated on the basis of the recognized machining condition data and additional shape data, and the fetched noncircular part shape data.

14. A computer-readable recording medium storing a machining data generation program for generating machining data on machining operations for shaping an external shape of a piston, to be executed by a computer, characterized in that the machining data generating program executes:

a procedure for reading a machining data sheet describing noncircular part shape data for machining a noncircular part having a noncircular cross section of the piston

together with machining condition data and for fetching the noncircular part shape data from the machining data sheet; and

a procedure for recognizing the machining condition data described in the machining data sheet and calculating NC machining data on the basis of the recognized machining condition data and the fetched noncircular part shape data.

15. The recording medium according to claim 14, wherein additional shape data on a part other than the noncircular part is described in the machining data sheet, and

the machining data generating program further executes a procedure for recognizing the additional shape data described in the machining data sheet and the machining condition data, and calculating NC machining data on the basis of the recognized machining condition data and additional shape data, and the fetched noncircular part shape data.